SS-R

JPRS: 4898

18 August 1961

SELECTED TRANSLATIONS ON USSR ELECTRIC POWER (11)

U. S. JOINT PUBLICATIONS RESEARCH SERVICE
1636 CONNECTICUT AVE., N. W.
WASHINGTON 25, D. C.

F O R E W O R D

This publication was prepared under contract by the UNITED STATES JOINT PUBLICATIONS RESEARCH SERVICE, a federal government organization established to service the translation and research needs of the various government departments.

SUBSCRIBING REPOSITORIES

SS-R

Boston University
725 Commonwealth Avenue
Boston 15, Massachusetts

Univ. of British Columbia
Vancouver 8, Canada

General Library
University of California
Berkeley 4, California

Russian and East European Center
University of California
Los Angeles 24, California

The Russian Institute
Columbia University
431 West 117th Street
New York 27, New York

Council on Foreign Relations, Inc.
58 East 68th Street
New York 21, New York

Duke University Library
Durham, North Carolina

Florida State Univ. Library
Tallahassee, Florida

Univ. of Florida Library
Gainesville, Florida

Harvard College Library
Cambridge 38, Massachusetts

Russian Research Center
Harvard University
16 Dunster Street
Cambridge 38, Massachusetts

The Hoover Institution
Stanford University
Stanford, California

Indiana Univ. Library
Box 248
Bloomington, Indiana

State Univ. of Iowa Lib.
Iowa City, Iowa

Joint University Libraries
Nashville 5, Tennessee

University of Kansas Library
Lawrence, Kansas

Univ. of Miami Library
Coral Gables 46, Florida

Michigan State Univ. Library
East Lansing, Michigan

University of Michigan Lib.
Ann Arbor, Michigan

Univ. of Notre Dame Library
Notre Dame, Indiana

Ohio State Univ. Libraries
1858 Neil Avenue
Columbus 10, Ohio

Univ. of Oregon Library
Eugene, Oregon

Penn. State Univ. Library
University Park, Penn.

University of Pennsylvania
Philadelphia 4, Penn.

Continued

Univ. of Pittsburgh Library
Pittsburgh 13, Pennsylvania

Princeton Univ. Library
Princeton, New Jersey

McKissick Memorial Library
Univ. of South Carolina
Columbia 19, So. Carolina

Univ. of Southern Calif. Lib.
University Park
Los Angeles 7, California

Syracuse University Library
Syracuse 10, New York

Tufts University Library
Medford, Massachusetts

Univ. of Vermont Library
Burlington, Vermont

Alderman Library
University of Virginia
Charlottesville, Virginia

Wayne State Univ. Lib.
Detroit 2, Michigan

Yale University Library
New Haven, Connecticut

Univ. of Washington Library
Seattle 5, Washington

JPRS: 4898

CSO: 1877-S/11

SELECTED TRANSLATIONS ON USSR ELECTRIC POWER (11)

[This report contains the translations of selected articles on electric power in the USSR published in various Soviet publications. Complete bibliographic information accompanies each article.]

TABLE OF CONTENTS

	Page
Electrification of Uzbekistan	1
Electric Power Consumption at Surface Mining Operations	4
Socialist Obligations in Hydroelectric Power Construction	7
Nurekskaya Hydroelectric Power Station	10
Lack of Coordination in Hydroelectric Power Construction	12
Future Development of Power Engineering	16
Electrification of Agriculture in the RSFSR	19
Electric Power in the Kuzbass	23
Electric Power Construction	26
Economizing on Electric Power	29
Thermo-Electric Power Stations	31
News Briefs	35

ELECTRIFICATION OF UZBEKISTAN -- Tashkent, Narodnoye Khozyaystvo Uzbekistana, No. 5, May 1961, pages 44-47.

The accellerated development of Uzbekistan's economy is closely linked with the rate of electric power construction. Production of electric power in 1965 will reach 12 billion as against 4.6 billion kwt/hrs in 1958, meaning an increase of 250%. During the years of the Seven Year Plan electric power stations with a total output of more than 1.5 million kwt will go into operation in Uzbekistan. The collective of power engineers at Uzbekenergo is successfully fulfilling the socialist obligations it has assumed. The plans for the first and second years of the Seven Year Plan for production of electric and thermal energy have been fulfilled ahead of schedule. During the two years of the Seven Year Plan, rayon electric power stations have put out above plan 609 million kwt/hrs of electric power and 190,000 megacalories of thermal energy.

Of primary significance for the development of the material-technical base in power engineering is capital construction. However, its rate and organization are not satisfactory. In 1959 only 25,000 kwt of new output were put into operation instead of the planned 175,000 kwt, 15% less, and last year only 193,000 kwt were put into operation instead of 362,000. 150,000 of these are carry-overs from the 1959 plan. Two boilers and a 100,000 kwt capacity turbo-generator at the Angrenskaya GRES, a boiler and 50,000 kwt capacity turbo-generator at the Fergana TETs imeni Lenin were not put into operation. This caused a power shortage of 70-80,000 kwt and consumer limitation in the amalgamated power system. There was also a delay in putting the first 12,000 kwt capacity plant into operation at the Takhiatashskaya GRES -- the first plant in the centralized power supply system in the Kara-Kalpak ASSR.

Network construction is also proceeding at a slow rate. Only 120 km have been put into operation of 420 km of 35 kv and higher transmission lines. Plan nonfulfillment for beginning of operations of new power facilities in the Uzbek SSR during the first two years of the Seven Year Plan is causing serious alarm, since Uzbekistan is producing far less electricity per capita than the other republics and the level for the USSR as a whole. During the past year production of electricity per capital in the Uzbek SSR amounted to 580 kwt/hrs with an average production of 1,360 kwt/hrs for the USSR. In 1965 Uzbekistan should produce 1,315 kwt/hrs

per capita with an average output of 2500-2600 kwt/hrs for the Soviet Union as a whole. This makes necessary an all-around speed-up in the rate of capital construction in endeavoring to put new electric power facilities into operation ahead of schedule.

First of all it is necessary to amalgamate power construction and consolidate the material-technical base of the construction organizations. At present construction of electric power stations and networks is being carried out by several organizations. Construction of the Angrenskaya, Takhiatashskaya GRESes and networks is being handled by the Uzbekgidroenergostroy Trust; the Tergana TETs No 2 is being expanded by Trust No 8, and the Navoinskaya GRES is being handled by another department. Although these organizations possess a powerful production base, they regularly fail to meet the construction schedule. The mechanization level of construction and assembly in these organizations is insufficiently high. The situation is aggravated by the fact that Glavstroyindustriya is doing a poor job of furnishing metal structures, prefabricated reinforced concrete, carpentry items and supports for power transmission lines. Assembly work at electric power stations is being carried out by several specialized organizations which are not interconnected, a fact which is not furthering the success of this venture. The fitting of boiler units and turbogenerators at the Angrenskaya GRES last year was done by the Sredazenergomontazh Trust of the USSR Ministry of Electric Power Station Construction (MEPSC), the thermal insulation work -- by Trust No 98 of the Uzbek SSR Ministry of Construction, the installation measurement-control instruments -- by the Special Trust of the RSFSR Ministry of Construction, and the industrial ventilation and sanitation jobs -- by the Santekhmontazh Trust of the Uzbek SSR Ministry of Construction.

At the Takhiatashskaya GRES, in the installation of exterior communications, the earthwork and construction of canals and wells is being handles by the Uzbekgidroenergostroy Trust, and the pipe-laying is being handled by the Santekhmontazh Trust, a fact which is leading to a constant lack of coordination, excessive correspondence and violation of the work schedule. Powerful mechanized columns are being used to an insufficient degree in the construction of power transmission lines. Changes have long ago matured in the organization of power construction organizations. Taking into consideration the continually increasing volume of capital investment in power engineering, it will be necessary to form in the republic, using Uzbekgidroenergostroy as a basis, a powerful construction-assembly trust equipped with a production base and means of mechanization for construction of

electric power stations. In order to put up electric power lines and substations it will be necessary to organize a special trust based on the assembly administration of the Uzbekgidroenergostroy Trust. All fitting and installation work, including heat insulation, the installation of measurement control instruments, industrial ventilation, as well as the unloading, receipt and storage of equipment should be handled by Sredazenergomontazh. It has long been necessary to introduce order in the delivery of euqipment and cable gear. How is equipment mounting progressing at new installations? Boiler Unit No 8 for the Angrenskaya GRES was delivered by the Taganrog Plant in the third quarter of 1960 instead of the first, the forced air ventilators arrived after a six months' delay, and other equipment was received either at the end of last year or at the beginning of this year.

Delivery of materials is even worse for the power network construction. 897 tons of wire were required for setting up the Namangan-Pap, Nukus-Chimbay and Yangiyer-Dzhizak electric power transmission lines, which were to begin operation in the fourth quarter of 1960. The delivery of 675 tons, or 76 % of the required materials, was finally ordered in the fourth quarter (when operations were to begin!). Of this amount, the Kirkabel' Plant delivered only 318 tons, and this was in December. We can hardly be satisfied with such "planning" of wire deliveries for installations which are to be put into operation. We might note that the Tashkent Cable Plant supplies the Kirkabel' Plant with aluminum rolls, while the latter produces the wire and once again ships it to Uzbekistan. One should consider if this type of industrial cooperation is expedient and whether it is not possible for the Tashkent Cable Plant to produce wire locally. These cases of arbitrary delays in delivery dates for allocated materials are not isolated facts. Equipment for the Dzhizak and Pap 110 kv substations, which were to be put into operation in the fourth quarter of 1960, was ordered by Glavenergokomplekt mostly for the first quarter of 1961.

Things are no better this year. Of the 1,995 tons of wire required for putting up power transmission lines, 500 tons are to be delivered in the fourth quarter, when operations are to begin. This faulty planning of deliveries of equipment, wire and cable gear is slowing down the beginning of operations of new power facilities and transmission lines with their substations. This increases the cost of construction and assembly and results in decreased quality.

ELECTRIC POWER CONSUMPTION AT SURFACE MINING OPERATIONS -- Moscow, Promyshlennaya Energetika, No 6, pages 2-4.

The recent general increase in the electrification level of mine pits has caused a sharp increase in electric power consumption on surface mining operations, as a result of which expenditures for electricity have occupied a weighty position in the cost structure of ore extraction. Therefore, technically progressive rate-setting and economy in use of electricity are important conditions for a further decrease in the cost of surface mining operations. In mines, particularly in surface mines, the expenditure of electricity per weight unit of useful or extracted depends on several arbitrarily changing factors: the physical properties and capacity of the rock structure, conditions of the ore seam, time of year and finally the productivity and type of working mechanisms and the skill of the excavator operator. Therefore, in order to determine mine power expenditure coefficients we use statistical data from many years of observation and the results of tests with excavators. This article will shed some light on the practice of electricity rate-setting and methods of economizing on electricity on the basis of experience gained in the operation of the bauxite mines of the Tikhvinskiy Aluminous Plant.

In view of the dispersed nature of bauxite deposits having a narrow, drawn out, lens form, ore extraction is conducted in several pits which are at some distance from one another. The stripping is done both by drags and single-bucket excavators of the mechanical shovel type, and the extraction is handled by mechanical shovels. Ten types of electric excavators are utilized at the mines, mostly of domestic manufacture, with scoop capacity of from 1-15 cubic m , conducted to machines at a current of 6 and 0.4 kw. In spite of comparatively severe winter conditions, mining is done evenly throughout the year. In the process of operating the excavators, once again the definite technical-economical advantages of direct current power supply were confirmed, and this refers to highly productive self-propelled drags and latest model low power caterpillar excavators from the Voronezh Plant.

Since the Tikhvinskiy Bauxite mines are characterized by very little flooding, a small volume of drill-detonation work and the organization of the centralized repair of electromechanical equipment in the plant's repair shops, the basic and most important consumers of electricity in the pits are

the excavators. Therefore, in the mining operations electrical balance sheet, the proportion of electricity expended for pumping water, drilling, illumination and other auxiliary requirements comprises an extremely small figure, about 2-5% of total electricity consumption.

The well thoughtout (sometimes differing from the plan) choice of location for the main step-down sub-stations, the efficient configuration of the pit high tension networks with the utilization of deep aerial leads to the excavator connection points and, finally, the capitol execution of 35 and 6 kv systems with sufficient capacity guarantee continual power supply to the mines with minimum power losses. For commercial calculation of electricity, each sub-station 35/6 kv transformer has active and re-active energy meters, and the 6 kv pit feeders -- active energy meters. In addition, the connection points for the large excavator-cells of the RVNO type 6 kv exterior units--have individual meters which make it possible to check electricity expenditure directly on the cutting face. This displacement of instruments ensures calculation of electrical energy for the mines and computation of the average fractional capacity coefficient. The volume of mining operations completed is determined by monthly mine surveying.

Until 1960 the Tikhvinskiy bauxite mines used a general mine or summary specific electric power consumption standard. This standard, determined as the relationship of all electricity expended by the pits to the weight of commodity or extracted (bauxite) for a given period in kw•hr/t, is a summary index which notes primarily the power consumption of the mining enterprise as a whole.

TABLE 1

Year	Summary specific expenditure of electric power, kw•hr/t	
	actual	planned
1956	7.8	8.0
1957	8.0	8.5
1958	9.3	9.3
1959	11.6	11.9
1960	12.4	12.8

The annual increase in productivity of the mines for the past 5 year period is accompanied by an increase in the summary specific expenditure of electric power, as is apparent from Table 1. This is explained by the fact that the correct

handling of mining operations caused a gradual, from year to year, increase in the stripping coefficient, which is now equal to 4 or 5. In addition, utilization of the most advantageous non-transport stripping method, efected by self-propelled drags, which carry out the lion's share of stripping operations, led to the replacement of thermal energy, which would have had to be used with truck or railroad transfer of rock deposits beyond the ore bed contours, by electrical energy. Under these conditions a regular increase in the specific expenditure of electric power is a logical phenomenon and it will continue until the completion of stripping operations. Consequently, methods of effecting savings in electric power in surface mines should be directed toward the efficient limitation of the above tendency, although this can be reflected in other expenditure items for mining operations. Although in 1956-1959 average annual actual specific expenditures did not exceed plan or were even lower, nevertheless the summary standard, being somewhat abstract, not reflecting the specific features of the individual deposits, was not able to stimulate an active campaign by the miners for savings in electrical energy. The differentiated norms for extraction and stripping in particular (for each pit and for the enterprise as a whole), introduced in January 1960, were to be more efficient and suitable for daily checks directly at the mines. In working out new norms attention was devoted to the work conditions in each pit (the planned coefficient of reestimation, the degree of flooding, soil category), the proposed introduction of powerful excavation machinery and experimental figures obtained during testing with excavators; work indices of the pits for previous years were also taken into consideration. The ratified differentiated electric power expenditure norms for 1960 and 1961 are given in tables 2 and 3.

Year	Differentiated Specific Electric Power Expenditures for the Enterprise (plan)	
	Extraction, kwt·hr/t	Stripping, kwt·hr/m^3
1960	0.94	2.7
1961	1.00	2.6

The new method of electricity consumption norm setting at surface mines was a progressive one. In 1959 all mines taken together saved 251,000 kwt/hrs of electricity, while the following year, under less favorable conditions, savings of 453,000 kwt/hrs were effected. These results were obtained not only by the care taken by the excavator brigades in power

use and a noticeable increase in personnel qualification and level of operations, but by effecting several measures. These include the following: decrease in the number of pump units or elimination of them by means of constructing drainage ditches; automation of pumping stations; maximum decrease of excavator transfer from one ledge to another; forced cooling of the turning engines on the old-type ESh 4/40 excavators with alternating current; decreased length of transformer idling and that of transformer units on excavators; strict fulfillment of centralized preventative repair of electrical machinery; increase in the quality of electrical equipment repair, leading to a sharp decrease in the breakdown rate and a decrease in motor losses; a system of awarding prizes to mine personnel for effecting power savings. As a result of

Table 3

Mines	Differentiated Specific Electric Power Expenditures by Quarters in 1960 (plan)							
	I		II		III		IV	
	extraction, kwt·hr/t (A)	Stripping, kwt. hr/t (B)	A	B	A	B	A	B
No 3-11 -12	0.9	2.0	0.9	2.45	0.8	2.2	0.8	2.0
No 7	0.9	---	1.35	---	1.2	---	1.1	---
No 9	0.8	2.8	0.8	2.8	0.8	2.85	0.8	2.85
No 13	0.8	2.8	0.9	2.85	0.8	2.85	0.8	2.85

the presence of direct-current self-propelled excavators with net synchronous motors and 425-1,600 kva capacity motor generators, during the past two years the capacity coefficient for mine electric units rose from 0.72 to 0.95-0.98.

SOCIALIST OBLIGATIONS IN HYDROELECTRIC POWER CONSTRUCTION -- Moscow, Gidrotekhnicheskoye Stroitel'stvo, No 6, June 1961, pages 1-2.

The news of the convocation of the 22nd Party Congress was a new and inspirational force in the campaign on the part of the Soviet nation for the successful fulfillment of the

Seven Year Plan. During these days of national political and labor plan, hydroelectric power construction collectives, endeavoring to prepare a worthy greeting for the 22nd Party Congress, have embarked upon socialist competition for the ahead-of-schedule fulfillment of the annual plan for putting new power facilities into operation, for further technical progress, for an increase in labor productivity, decrease in construction cost and improvement in job quality. Socialist obligations were discussed broadly among the collectives of construction-assembly administrations and accepted at general meetings and meetings of Party-economic construction activists.

In their obligations the builders provide for ahead-of-schedule fulfillment of the 1961 plan, the beginning of operation of new power facilities and installations of the construction industry, industrial installations, housing, installations for cultural purposes, etc. In the competition many brigades are competing for the coveted title of Brigade of Communist Labor. We shall include the following basic obligations accepted by certain hydroelectric power construction collectives:

Bratskgesstroy. 1. To complete installation of four 225,000 kwt hydroelectric power station units in the fourth quarter, two of them to be installed by the opening of the 22nd Party Congress; during the conference one hydroelectric power unit is to be started up. 2. By the day of the opening of the 22nd Party Congress one million cubic m of concrete are to be poured of the 1,250,000 cu m to be poured for constructing the pressure front of the first unit. 3. To fulfill by the day of the opening of the 22nd Party Congress the annual housing and cultural construction plan: beginning with the second ix months of the year to begin construction of large-panel buildings. 4. To increase industrial production 2% above the established plan through improved use of production space and equipment. 5. Through the broad implementation of the latest production methods conditional annual savings are to be achieved of at least two million rubles from inventions and efficiency measures.

Krasnoyarskgesstroy. T. To complete in 1961 five million cubic m of earth moving-rock operations instead of the 3.2 million cubic m established by the plan. 2. To increase the utilization of prefabricated reinforced concrete to 16,000 cubic m in 1961 as against 6,450 cubic m in 1960. 3. To put the bridge across the Yenisey River into operation by 10 June 1961. 4. To make it possible for work trains to get as far as the station of Divnogorsk.

Stalingradgidrostroy. 1. To start operation of three small 33,000 kwt capacity units in the third quarter, and by 13 August, the day of the construction man, to prepare the Stalingrad Hydroelectric Power System to begin industrial

operations for the state commission. 2. To put new facilities into operation at construction industry installations, insuring the construction of industrial enterprises by means of industrial methods.

Kremenchuggesstroy. 1. By 13 August, the day of the construction man, to prepare to hand over to the state commission the Kremenchug GES, in industrial operation; to complete construction and landscaping of the construction personnel's settlement and to submit it to the state commission. 2. To construct and start operations in the fourth quarter on the first unit of the reinforced concrete product plant at the Dneprovskiy Combine.

Votkinskaya GES Construction Project. 1. By the opening of the 22nd Party Congress to complete the spanning of the Kama River: to complete the ten-month plan for pouring monolith concrete and prefabricated reinforced concrete; to fulfill the annual plan for housing construction. 2. By 1 October 1961 to produce and install the crane support beams for the overflow dam of prestressed reinforced concrete.

Kaunas GES Construction Project. 1. To submit the GES to the state commission by 20 July 1961.

Plyavinskaya GES Construction Project. 1. To complete the ten-month construction program for the GES by the opening of the 22nd Party Congress.

Kiev GES Construction Project. 1. By 13 August, the day of the construction man, to complete construction of the coffer-dams, excavation of the foundation area and to begin pouring concrete in the basic structures. 2. To pour 55,000 cubic m of concrete and reinforced concrete in the basic structures.

The collectives of the Gidromekhanizatsiya, Gidrospetsstroy, Gidromontazh, Gidroelektromontazh and Spetsenergomontazh construction-assembly trusts provide in their obligations for the assurance of fulfillment of the obligations assumed by the collectives of the construction organizations of Glavgidroenergostroy. Due to the fulfillment of the socialist obligations assumed by construction projects in 1960, plan overfulfillment was effected for beginning of operations of facilitities at hydroelectric power stations. This year construction men and fitters, the designers and employees of scientific research institutes also must do everything in their power to assure the fulfillment of the assumed obligations. Party, union and Komsomol organizations will lead this campaign and will lend the necesaary aid to the participants in the competitions. There is no doubt about the fact that the collective of hydroelectric power construction men, which numbers in the thousands, will honorably fulfill the obligations assumed by them and will bring

a worthy greeting to the 22nd Party Congress.

NUREKSKAYA HYDROELECTRIC POWER STATION -- Moscow, Gidrotekhnicheskoye Stroitel'stvo, No 6, June 1961, pages 3-7.

In 1961 construction was begun in the Tadzhik SSR on the 2700 Mvt capacity Nurekskaya GES. The beginning of construction was preceeded by detailed planning carried out by the Central Asian branch of the Gidroenergoproyekt (Saogidep) Institute according to the plan for the total use of the Vakhsh River and the planned task for the Nurekskaya GES, which is the fourth level of the Vakhsh cascade. The Nurekskaya GES, possessing great output capacity and providing extremely cheap electric power, will be the model unit for the creation of a single Central Asian Power system, which will make it possible to amalgamate new regions with it and make use of the natural resources of a great part of Central Asia.

The utilization of the power of the Vakhsh River began in 1958, when the 30 Mvt capacity Perpadnaya GES was put into operation. At present two more GESes are being constructed on the river: the Head and Central, which are to begin operations in 1962 and 1963. The hydroelectric power resources of the Vakhsh are estimated to be 40 billion kwt/hrs with an annual waterflow of about 20 cubic km. The major part of the potential energy of the Vakhsh is concentrated in its mountainous sector, before it enters the Vakhsh Valley: the potential output of the seven GESes planned for this section totals more than 30 billion kwt/hrs per year. The unequal waterflow throughout the year, fluctuations in observed waterflow from 150 cubic m/sec in the middle of winter to 3,800 cubic m/sec during summer high water, predetemmine the necessity for building a large reservoir. The Nureksaya Hydroelectric Power Station, effecting a 250 m head of water, forms a reservoir with a total revolume of 10.5 and useful volume of 4.5 cubic km, which will assure a full annual regulation of waterflow and increase to the winter guaranteed capacity to approximately one million kwt.

Due to the construction of the Nurekskaya Reservoir, it will be possible to irrigate about 100,000 ha of fertile land in the Dangarinskaya Steppe in Southern Tadzhikistan. The further development of irrigation in Southern Tadzhikistan can be effected exclusively on the basis of the

broad implementation of machine irrigation. As a result of the construction of the Nurekskaya GES, particularly great possibilities open up also for the development of irrigation in the western oblasts of Uzbekistan: Bukharskaya, Samarkandskaya and Surkhandar'indkaya, where under favorable climatic conditions about two million ha can be put under cotton with the aid of irrigation. The irrigation plan is to be carried out with the broad utilization of electric power from the Nurekskaya GES, while (according to figures by Engineer Smol'yaninov) the irrigation of the primary 500-700,000 ha will require less capital investment in irrigation equipment by 400 million rubles (1961 prices) in comparison with the present plan for irrigation, based on gravitaional irrigation.

The Nurekskaya Hydroelectric Station (figures 1 and 2) is situated in the Tadzhik SSR. A motor vehicle road crosses the territory of the GES, which makes it possible to deliver freight without additional expenditures for its improvement this year, from the railroad station Yangi-Bazar (city of Ordzhonikidzebad) to the construction site. The GES includes the following a rock dam with a central loamy core, an open GES machinery building, in which it is planned to set up nine 300 Mvt units, fed by three pressure tunnels 10-11 m in diameters (each tunnel will feed three units) and a surface water escape (calculated flow -- 4,000 cubic m/sec). Construction expenditures are planned for two bypass tunnels 11 by 12 m in cross-section.

The GES construction site is equipped with subsidiary-auxiliary construction enterprises and housing for 20,000 construction workers, most of the buildings of which will be four stories high. The dam (figure 3) will be of rock with a central loamy core, protected by transitional sand-gravel zones, including a single-layer filter in contact with the core. The volume of the outer rock layers is 34 million cubic m, the summary volume of the core (loam) about seven million cubic m, and the transition zones --gravel-sand mixture -- about 4 million cubic m. (In the Central Asian branch of the Gidroenergoproyekt Institute three variations of the Nurkskaya GES dam were developed: arched, sand-gravel and rock. All three variations were subjected to careful expert examination in the MEPSC, in the USSR Gosstroy jointly with the Academy of Construction and Architecture, and in the State Economic Council. The expert examination established that all three variations differed little from each other according to technical-economic indices and could be used. As a result of comprehensive comparison, the rock dam variation with a central loam core was chosen). The open building (on the surface) of the GES (without the

engine room is typical in construction for derivation stations. The power transformers, placed close to the turbines, produce electric power at 220 and 500 kv. The surface water escape is in concrete, and is equipped with flat water gates, beyond which is an open canal, cut into the rock. The canal sections are not reinforced.

Figure 1. General diagram of the GES: 1) construction bypass tunnels; 2) upper coffer-dam (most of the volume goes into the body of the dam); 3) water intakes for the GES; 4) the same, primarily at intermediate pressures; 5) turbine penstocks (three-branch pressure tunnel); 6) surface GES machinery building; 7) ORU 500 kv; 8) LEP 500 kv; 9) ORU 220 kv; 10) LEP 220 kv; 11) surface high-water water escape; 12) break lines.

Figure 2. Nurekskaya Gorge with dam of the Nurekskaya GES.

Figure 3. Rock dam of the Nurekskaya GES with central core: 1) upper construction bulkhead; 2) loam core; 3) rock; 4) double layer filter (one layer of constant thickness of three m with siftings of fractions larger than 20 mm, the second layer of variable thickness with siftings of fractions larger than 400 mm); 5) cement base, eight m in thickness; 6) layer of injected concrete 10 cm thick; 7) edge of primary dam.

Figure 4. Cut along the axis of the construction tunnel: 1) entrance portal; 2) break-down repair water gate controls; 3) beginning of sector with metal facing; 4) conical gates; 5) freight shaft; 6) gunite 20 cm thick in metal-net framework; 7) concrete facing 40 cm thick and metal facing 12 mm thick.

Figure 5. Axial cut of turbine penstock: 1) beginning of sector with metal facing; 2) concrete facing 40 cm in thickness.

Figure 6. Machinery building of GES: a) cross-section along the axis of the unit; b) longitudinal cut.

LACK OF COORDINATION IN HYDROELECTRIC POWER CONSTRUCTION -- Moscow, Ekonomicheskaya Gazeta, 10 June 1961, page 3.

In September of last year our newspaper printed an

article entitled "Expensive Noncoordination". It stated that the planning of hydroelectric facilities is being carried out without consideration of the planning of reservoir beds, without a profound study of all economic problems connected with hydroelectric power construction, and that this is costing the state dearly. Sometime later the editors received and printed an answer from the Minister of EPSC, I. T. Novikov. Although the minister recognized the necessity of eliminating the major defects noted in the article, he placed this task primarily before other organizations and even before individuals. Printing Novikov's answer, the editors stressed in their adjoining remarks that the problem could be solved only with the coordinated efforts of several organizations, among which far from the smallest role should be played by the MEPSC. Unfortunately the facts brought out in this article by a group of engineers speak of something entirely different.

Recently many articles have appeared in the press on the future of GES construction, including the construction of such major installations as the Ust'-Ilimskaya and Sayan GESes, the Kamsko-Vychegodsko-Pechorskoye water junction and others. This caused us once more to return to the problem presented by Ekonomicheskaya Gazeta in the article "Expensive Noncoordination". In our opinion the MEPSC has not come to the necessary conclusions and is continuing to hold its bureaucratic views. At any rate, it has not taken any measures to eliminate lack of coordination in planning GESes and even reservoirs, let alone industrial complexes connected with GESes. This ministry, as the general planning agency, is allocated funds for the timely and complete planning of GESes, an integral part of which are reservoirs. The general planning agency should distribute these funds without delay, draw up contracts and issue instructions to specialized planning organizations, requested to work out suitable sections of the complex plan for the construction project. How are these functions being carried out by the MEPSC? In spite of the sad example of lack of coordination in the Bratsk GES, as stated in the article, evidently Novikov was not convinced that work on the reservoirs in heavily wooded areas cannot be done simultaneously with construction. We shall go into this with other examples.

Let us take the Ust'-Ilimskaya GES. The MEPSC began planning it in 1953. In order for the early preparation of the water area of the GES's reservoir, where more than 14 million cubic m of timber were concentrated, it was necessary to carry out a major planning-survey project. However, the funds were allocated to Giprolestrans only last year. This delay will inevitably lead not only to

excessive and unjustified expenditures but to the loss of a tremendous quantity of timber. The planning organizations of the MEPSC began working in 1955 for the Zeyskaya GES. They allocated 11.5 million rubles (old currency) for 1 July 1960. Giprolestrans was allocated 25,000 rubles in 1960. It is true that it is proposed to allocate one million rubles in one lump sum in 1961. By the middle of the year the institute must submit the completed results, although by this time it will only be able to begin the survey. The volume of surveying is tremendous, since the timber reserves in the flooding zone are estimated at 7.2 million cubic m, and if only the workable wood is to be taken out in time it is necessary to organize seven units, organize the floating of log rafts down the Zee River, set up a lumber loading base and construct a 250 km long mountain road, etc. The Amurskaya Oblast are not unjustified when they insist on rapid preparations for the reservoir and, realizing the tremendous amount of work required, demand the immediate submission of plans. The MEPSC since last year has been readdressing their demands to Giprolestrans, although it submitted the technical conditions for the planning project only this year!

Things are even worse at the Vilyuyskaya GES. In the long-since completed project drawn up by planning institutes of the MEPSC, only two paragraphs are devoted to problems of timber use in the reservoir flood zone. The first one states that timber reserves total from 120 to 140 cubic m per ha, but that workable lumber will amount to only 26 cubic m per ha. We read in the second paragraph: "In view of the fact that the construction area is little populated and the majority of the timber is of low quality and has no market value, it has been decided to let it be flooded over. The area to be covered during primary flooding alone will contain about eight million cubic m of timber. Even if we accept at face value the statement on the part of the planners that only 15% of the timber is workable, it is incomprehensible why they decided to supply all lumber and saw-timber necessary for the construction project from Irkutskaya Oblast by floating it down the Lena River to Mukhtuy, from where it is transfered to trucks for the remaining 336 km.

Giprolestrans has been requested to include in the plan a project for protecting the structures of the dam site from the timber which will float down after the reservoir is filled up! We are convinced that under conditions of permafrost, in which the reservoir is situated, after it is filled up, not only timber will float to the surface. Together with its root system, which in these regions spreads out along the surface, entire islands of peat will

come up. Protection of the structures from all this timber and peat is not a simple matter. Why then did they mention it only after construction on the GES had already begun? The situation at the Khantayskaya GES is completely analogous. It is being constructed 60-80 km from the large Igarka polar woodworking industrial complex. The timber in its reservoir will also be flooded. Last year hydroelectric construction men completed the primary projects for the Sayan GES, the tremendous reservoir of which will cover huge tracts of forest. Thought should have been given to making use of this timber. However, this was not done.

Many articles devoted to the construction of the Kamsko-Vychegodsko-Pechorskoye water junction, published in recent months in several newspapers, contain amateurish opinions to the effect that the 85 million cubic m of timber in the future bed of this reservoir can be harvested and processed with the aid of floating timber combines developed by planning organizations of the MEPSC. In this manner the position taken by the ministry, which is not carrying out the necessary measures for harvesting the lumber before the reservoir is filled up, is as if justified. It is a known fact that foresters have developed several types of combines working under less complicated conditions -- not under the water but on dry land. Nevertheless, in productivity and economical operation they still can not compete with small combined brigades equipped with light gasoline-powered saws and tractors. The MEPSC, working for years on the project of the Kamsko-Vychegodsko-Pechorskoye water junction and not utilizing for this purpose special planning organizations, is placing all its hopes on floating combines which have not been proven in actual operations.

The ministry also fails to consider that in the zone of the future reservoir dozens of timber enterprises are already operating. They should have long ago revised production volume, area of operations, order and method or timber cutting in order to coordinate their program with the preparations of the reservoir basin. These examples show that the MEPSC is not carrying out the functions of a general planning agency. Perhaps the funds for planning operations connected with the complete solution of GES construction should be allocated directly to the organizations participating directly to one degree or another in this business. With this a central agency should be nominated to effect coordination of all this work. These problems are of great significance for the national economy and they should be solved correctly.

FUTURE DEVELOPMENT OF POWER ENGINEERING -- Moscow, Teploenergetika, June 1961, No 6, pages 3-5.

In order to greet the 22nd Party Congress, the persons working in Soviet power engineering -- workers, technicians, engineers and scientists -- should make greater use of our truly inexhaustable potential, should reduce to a minimum the time required to construct new electric power stations. We should do everything in our power in order to overtake and surpass the US in electric power output. The tremendous advantages of our socialist system and the planned development of our economy produce the potential to resolve this task in a short period of time. The future development of power engineering in the Soviet Union will be successful in the same degree as we are able to effect a rapid increase in the technical level of power output, and as we produce new discoveries and inventions, so important for operations, as we find rapid and practical utilization of all the newest achievements of science and technology.

An increase in the effectiveness of the operation of electric power stations is possible through the further improvement of equipment and technological processes and the development and utilization of totally new and more profitable methods of obtaining electric power. Work in both directions would be expedient. Speaking of the first path, we must mention an increase in the unitary capacity of boilers, turbogenerators and electric power stations as a whole, an increase in the reliability and economic effectiveness of their operations, improvement and broader utilization of automation, the utilization of improved construction materials and decrease in the cost of these materials, an increase in the initial steam parameters and utilization of new work agents and heat carriers, improvement in the thermodynamic cycles of transforming heat into work and the development of new cycles. Following this path it is possible to effect significant decreases in the cost of electric power obtained. In our opinion the utilization of steam-gas cycles, which would make it possible to combine successfully the advantages of steam-powered and gas turbines, presents particular interest. Such projects are being conducted in the Central Boiler-turbine Institute (Leningrad) and in the Siberian branch of the Academy of Sciences (AS) USSR (Novosibirsk). These projects are worthy of attention and support. In our opinion much interest is also generated by the development of a unit which would use carbonic acid

gas as a working agent. A project in this direction is being carried out in the Odessa Food Industry Institute. In the Moscow Higher Technical School, an extremely interesting, from our viewpoint, project is being carried out on the improvement of the gas turbine cycle with the utilization of considerably higher initial pressures.

All these trends in the development of thermo-power engineering require a large number of thermo-physical projects directed primarily at studies of the thermodynamic properties and heat exchange conditions of a large number of substances in a broad range of parameters. This type of research is being carried out in many scientific research institutes, in labs and VUZes. In our opinion these projects should be expanded quantitatively. At present we possess skilled cadres of scientific workers and, what is particularly important, people who can successfully cope with this task. It is important that the number of practically important substances for which there are sufficiently accurate tables of thermodynamic properties and data on heat exchange should increase continuously. For the time being adequately complete (although requiring further specification and expansion) tables of this type are available only for steam. It is essential that other "swallows" follow this first one.

Even greater possibilities are opened up by the second path -- the development and utilization of totally new methods of obtaining electric power. This trend in the development of power engineering is dictated by life itself. For example, how does a modern atomic electric power station operate? It is extremely simple to answer this question: the diagram of a modern atomic electric power station is quite similar to the diagram of an ordinary thermo-electric power station operating on chemical fuel. The basic difference consists in the fact that the ordinary boiler of a thermo-electric power station is replaced by a reactor in an atomic electric power station, and nuclear fuel is used instead of chemical. Naturally in replacing the boiler of the thermo-electric power station by a nuclear reactor, it would be desirable to improve also the process of transforming heat into work, rejecting the turbogenerator unit which is usual for the thermo-electric power station. It is well known that in principle this task can be solved. One of the methods of solving it is the utilization of thermoelements, making it possible to transform heat into electric energy without the application of machinery and intemediate heat carriers and work agents. But for its practical realization it is necessary to build a reliable and highly economical unit with the utilization of thermoelements possessing a high useful action coefficient for transforming heat into electrical en-

ergy.

For the solution of this important scientific and economic task much work on the part of engineers and scientific workers of various specialties is essential. An important role in the resolution of this task should be played by thermophysicists. Life places new and complex tasks before thermophysics, particularly in the field of studying the thermophysical properties of solid bodies, particularly semiconductors. No less interest, from the viewpoint of developing a more effectivement of transforming heat into electrical energy, is presented by the utilization of the magnetohydrodynamic method. Its essence of course consists in the creation of current or flow consisting of electrically charged particles and the transformation of the high-velocity energy of this flux directly into electrical energy. It is possible to create flux consisting of electrically charged particles by means of various methods. It is possible to create this flux by heating gas and transforming it into a plasma. Probably another method is also possible -- obtaining charged particles in the flux with the aid of external influence without the use of extremely high temperatures, the aplication of which would create great technical difficulties.

From our point of view the development of the magnetohydrodynamic method of transforming heat into electrical energy is of great interest. In the solution of this problem, a great, if not decisive, role will be played by thermophysics. But for the solution of this problem thermophysicists must occupy new frontiers and engage in research on the thermodynamic properties and heat exchange of plasma, and must construct precision equipment designed for temperatures of thousands and tens of thousands of degrees. Almost exclusively physicists are now engaged in solving the problem of obtaining a controlled thermonuclear reaction. This task is as important as it is difficult. However, projects by Soviet, and subsequently British and American physicists have shown that it is basically possible to achieve a controlled thermonuclear reaction, since the principle of magnetic thermoinsulation has been discovered. Without a doubt the time will soon come (if it has not already) when scientists and engineers of various specialties will be drawn into the solution of this extremely complicated problem. The role played by thermophysics will be extremely important. Then we shall be dealing with temperatures measured in hundreds of millions of degrees.

In recapitulating the tasks of thermophysics, one can state without fear of exaggeration that thermophysics right now is faced by new and extremely difficult and interesting

problems. It will be necessary to develop new and incomparably more complicated methods of measurements, to deal with unusual temperatures and greatly expand the limits of theoretical and experimental research. For the fulfillment of these complex tasks it is essential to have a maximum expedient organization of projects and a maximum expedient placement of cadres and utilization of material potential. The CC of the Party and USSR Council of Ministers, as is well known, recently passed a resolution "Measures for Improving the Coordination of Scientific Research and the Activities of the Academy of Sciences USSR". A USSR Council of Ministers State Committee for the Coordination of Scientific Research has been formed. This resolution is an extremely important stage in the further development of science and technology. It will lead Soviet science and technology toward the number one position in the world in all important fields.

ELECTRIFICATION OF AGRICULTURE IN THE RSFSR -- Moscow, Voprosy Ekonomiki, No 6, June 1961, pages 148-152.

Communist construction at the present stage is indissolubly linked with the development of electrification -- this foundation for the material-technical basis of Communism. During the next 15-20 years it is essential to effect the complete electrification of the country, in order to supply all branches of the national economy with sufficient electric power, including agricultural production. In view of this the problem of agricultural electrification takes on particular significance. One of the most important elements in effecting rural electrification is the correct selection of electric power supply sources. In 1961 the union republic councils of ministers were requested to determine the most economical sources of electric power supply both for kolkhozes and sovkhozes. In particular, in 1961-1965 electrification of agriculture is to be carried out by linking it with existing and newly constructed electric power lines of state and communal electric power stations, as well as traction substations of electrified sections of railroad.

The system of centralized electric power supply is particularly effective. It assures continuous supply to kolkhozes, sovkhozes, tractor repair stations (TRS) and inter-kolkhoz enterprises with cheap electricity. Therefore, it is most expedient to electrify agriculture,

linking kolkhozes and sovkhozes with powerful state power systems. In 1965 approximately 80% of all agricultural enterprises are to be linked up to state power system networks. In regions where such power networks do not exist it will be necessary to construct rural rayon and interrayon diesel-electric power stations and hydroelectric power stations of increased capacity, and in individual cases -- steam-turbine and gas turbine electric power stations. In sparsely populated regions, where it is not expedient to construct rural rayon and interrayon power stations, inter-kolkhoz, kolkhoz and sovkhoz electric power stations according to the most economical plan possible should be constructed with the purpose of gaining time. This has made it necessary to increase to a considerable degree in 1961-1965 the volume of state capital investment in the electrification of agriculture. In the present Seven Year Plan 2.5 times more projects will be carried out in the area of electrification of kolkhozes and sovkhozes than in 1952-1958. Due to this fact, kolkhozes and sovkhozes will be able to make broader use of electric power in production.

However, this level will not assure the total electrification of all stationary production processes on all farms. During the present Seven Year Plan many rural rayon transformer substations operating at 110/35/10 and 110/10 kv with a total output of 930,000 kv are to be constructed and put into operation, with 110 kv transmission lines 4,110 km long, as well as 35.10 kv rural rayon transformer substations at an output of 3,400,000 kv with 35 kv electric power transmission lines 36,500 km in length. Rural GESes with a total output of 17,100 kv and thermo-electric power stations with a total output of 394,000 kv will be built and put into operations

Implementation of projects for effecting electrification of agriculture is one of the basic measures for facilitating the labor of millions of farm workers, increasing agricultural production and decreasing its cost. Therefore, at the present time tremendous significance is acquired by research in the economic effectiveness of the electrification of various agricultural production processes, determination of the indices of this effectiveness, in particular those such as increase in the labor productivity of kolkhoz and sovkhoz workers, increase in production yield, decrease in cost, improvement in machinery use, local power resources.

It is now particularly important to base in concrete conditions the economic expedience of a particular variation of electrification -- the advantages of building a rural thermal or hydraulic station or hooking up to a state power system, etc. In this it is essential to make a profound

study of the experience in constructing such economical and fully automatic rural GESes as the Novo-Troitskaya in Stavropol'skiy Kray, the Shil'skaya in Pskovskaya Oblast, etc. We should mention that neglect of the questions of economic effectiveness in the electrification of agriculture at one time had a negative influence on its development, particularly on the determination of the most efficient and advantageous trends in power construction. The basic reason for the comparatively low level of electrification of kolkhozes was the fact that prior to 1954 mostly small kolkhoz GESes were built. Due to this funds were scattered, the cost of electric power was increased, and operational expenditures were high. Subsequently it was decided to carry out rural electrification both by hooking up to state power systems and electric power stations and on the basis of the construction of diesel-electric power stations. This made it possible to speed up the rate of electrification. For example, in 1958 the number of electrified kolkhozes was more than twice that of 1954.

However, even this rate of electrification cannot satisfy the requirements of agriculture. A major breakthrough in the development of the electrification of this important branch of the national conomy must be made now in view of the several major state electric power stations beginning operations. This opens up vast opportunities for the electrification of kolkhozes. But this potential is not yet being used satisfactorily. Many low-power thermo-electric power stations are still operating in rural areas. They produce very expensive electricity, a fact which naturally has an effect on the cost of agricultural production.

The electrification of kolkhozes, sovkhozes and TRSs should be effected, as has been stated, chiefly by hooking them up to the power networks of state power systems and electric power stations. A great aid in rural electrification are also traction substations along electrified sections of railroad. Since all of these power installations are built at the expense of the state, kolkhozes have the opportunity to increase their contribution to the electrification of agricultural production by increasing the size of their capital investment. At the beginning of 1960 the total capacity of rural electric power stations and power plants in the RSFSR was 2.84 million kwt, which included the following: rural electric power stations -- 1.84 million kwt, rural klokhoz, sovkhoz and TRS electric power plants linked with power networks of state power systems and electric power stations -- one million kwt. However, at the present time the electric power output of the majority of kolkhozes and sovkhozes cannot satisfy the increased and still increasing requirements

of agriculture in the RSFSR. One can draw conclusions on the increase in consumption of electric power in agriculture in the RSFSR in 1953-1959 with the following figures:

Electric Power Obtained (in million kwt/hrs)	1953	1959
Total	1267	3714
Including:		
Kolkhozes	436	1952
Sovkhozes	345	1307
TRSes	486	455

In spite of the fact that rural areas received almost 300% the amount of electric power in 1959 as in 1953, electrification of kolkhozes and sovkhozes is still at a low level. This is apparent from the following figures: electric power in 1959 rated per able-bodied kolkhoz member in the republic amounted to 179 kwt/hrs, per sovkhoz worker -- 561 kwt/hrs, and at TRSes -- 331 kwt/hrs. Of the total amount of electricity consumed in 1958, 55% went for production needs on kolkhozes, 75% on sovkhozes, and 94% at TRSes. The remainder of the electricity consumed was used for the electrical lighting of residences and public buildings.

On several leading kolkhozes, where electricity is used widely for the electrification of production processes, economy was improved and labor productivity increased. Characteristic in this respect is the "Forward" Kolkhoz in Krasnoarmeyskiy Rayon of Chelyabinskaya Oblast, on which 102 electric motors are in operation with a total output of 700 kwt. Annual consumption of electricity exceeds one million kwt/hrs. The annual decrease in labor expenditures was expressed in the amount of 500,000 man-hours. On this kolkhoz electricity replaces the labor of 160 kolkhoz workers throughout the year. As regards agricultural production expenses, they have decreased to a significant degree.

The experience of many leading electrified kolkhozes and sovkhozes confirms the high rate of economic effectiveness of the electrification of agriculture. The transfer of a large number of stationary production process to electric power cuts down labor expenditures in productive stock-raising by 40-50%, and in agricultural production as a whole 25-30% of summary labor expenditures are saved. In such a case, how can we explain the insufficient implementation of electric power in agricultural production in the RSFSR? There are several reasons for this. Perhaps the basic one is the fact that the mechanization of many labor-

consuming processes in agriculture on the basis of electrification is delayed due to a shortage of electric motors. For 1 January 1960 there were 15 electric motors on the average per electrified kolkhoz, 44-46 per sovkhoz and 38 per TRS. At the same time at least 30-45 electric motors are required merely for shifting to electric power in the basic stationary production processes in the artel, if one proceeds from the practice of leading electrified kolkhozes. This is why it is essential to greatly increase the production of 0.1 to 30 kwt electric motors as soon as possible for the needs of agriculture and to supply kolkhozes and sovkhozes with the necessary quantity of wire, particularly bare and winding wire, insulators and other equipment. Plants must be prohibited from producing agricultural machinery without electric wires, that is, without electric motors and starting mechanisms.

All of these problems should be solved primarily by the RSFSR Gosplan and the RSFSR Economic Council, which should have the sovnarkhozes of the RSFSR take active part in the electrification of agriculture. This participation should be expressed primarily in the activization of those branches of industry which fulfill the orders of rural electrical engineers. The incorporation of electric power in agricultural production has been slowed down up to the present by existing electricity rates. The rate for kolkhozes, sovkhozes, TRSes and other agricultural consumers has been set at 1.9 kopecks per kwt/hr of electricity expended for production needs. At the same time industrial enterprises pay 0.5 to 1.2 kopecks per hour. There is no question about the fact that right now it is necessary to decrease the rate for electricity used by agricultural enterprises 200-250%.

ELECTRIC POWER IN THE KUZBASS -- Moscow, Izvestiya, 28 June 1961, page 3.

The electric power stations of the Kuzbass are now producing ten times more power than all of Russia did in 1913, and as much as all the stations in Italy. In recent years the Yuzhno-Kuzbasskaya GES was built, as well as five powerful turbines at the Tom'-Usinskaya GRES, and the first line at the Novo-Kemerovskaya TETs, and the capacities of several other stations have been increased. Last year more than 200,000 kwt of power output were developed in the Kuzbass,

and 736 km of high-tension lines were put up. It would seem that this were a fair figure, but there still is a shortage of electric power and heat for the normal operation of industry. History has never experienced the rapid rate of development in Siberia and particularly the Kuzbass. Each year the Kemerovskiy Economic Rayon receives 500 million rubles (in new currency) for the construction of new plants, worker settlements, mines, and heavy chemical enterprises. Power engineering should lead all other branches in its development.

What is happening in the Kuzbass? In 1959 the output of its power stations increased 36%, in 1960 -- 14%, and in 1961 no increase is expected. Here power engineering not only does not lead but lags behind the development rate of the coal industry, metallurgy and the chemical industry. Why has such an abnormal situation developed in this major economic rayon? I recall the rainy November days of 1958. At that time the entire Southern Kuzbass was eagerly awaiting the first power from the Tom'-Usinskaya GRES. Due to a shortage of electric power the Stalinskiy Aluminum Plant, mines and many other enterprises could not work at full capacity. Airplanes delivered not only instruments for the GRES but also equipment. Two and three fitters were working where only one should have been. People remained on the job for several shifts in a row. The collective was accomplishing a valiant deed. Finally the first 100,000 kwt turbine began to produce current! In order to breathe life as rapidly as possible into the silent machine tools and motors, the power engineers of the Kuzbass made concessions to the construction men. The electric power station was put into operation with much remaining to be done, without proper facilities, and the personnel housing remained without heat. This all-hands job was of great expense to the country, but did it teach anything to those who are planning and directing construction?

Once again I am at this construction site, which is particularly important. I walk around, talking with workers and foremen, endeavoring to find those I met about three years ago. Almost no-one is left, but very little has changed. The construction job is not fulfilling its plan. The fifth turbine is operating at half capacity -- the tenth boiler has not yet been installed, although it was to be put into operation last year according to schedule. In the fourth quarter of this year the MEPSC promised th deliver a 200,000 kwt turbine. But much time has already been lost. The body of the main building has not yet started construction. Several months will be required for this. The placement and installation of boiler and turbine will also require much

time. But the first half of the year is almost over...

In three years three construction bosses and three chief engineers have been replaced. Now the ministry has allocated equipment and materials to the Tom'-Usinskaya GRES. But nevertheless, in spite of all this, things are going slowly. The five-month plan was fulfilled at 83%. The construction workers are spread out. They are building 197 installations at once. Before each unit at the Tom'-Usinskaya GRES goes into operation, the vice-minister of Construction of Electric Power Stations USSR, Finogenov, head of Glavenergostroy, Kudryavtsev, and director of the Sibenergostroy Trust, Suvorin, come out to the site. At that time they expend great effort in solving important problems. This is fine. Unfortunately, the directors of the trust and ministry come only before units are about to go into operation. They devote precious little attention to work organization, construction economy and the well-being of the workers. I left the Tom'-Usinskaya GRES with an uneasy feeling. But I thought, the ministry has many such construction projects. It is possible that things are going better at others. This is what brought me to the Belovo GRES. Construction began in 1956. Equipment and materials were hauled in to Belovo. But some time later, for some reason they began to haul the equipment away. The Belovo power construction collective had a difficult time of it, and people began to leave this spot which they had grown so fond of. The directors of the Belovo GRES, Kuzbassenergo, asked Minister Novikov, head of the USSR Gosplan Electrification Division Ozerov, and head of the RSFSR Gosplan Electrification Division, Krasnov, to prevent the work stoppage on this important project. Without bothering to check into the future plans of development of the economic rayon, these gentlemen answered that there was enough output without the Belovo GRES. And they, in effect, put the station away on ice. The ministry then came out with the following argument: we shall build the Krasnoyarsk GES in a hurry and furnish enough power to the Kuzbass. Three years have passed since then. What has happened? The Krasnoyarsk GES has not been put into operation and only the foundation excavation has been dug for the Belovo GRES. The only unit the construction of which is ahead of schedule is a 150-m ventilation pipe. But it seems that this pipe is not being built by organizations belonging to the ministry. The construction boss of the Belovo GRES, Tomilov, an experienced engineer who has built more than one GRES, has the following to say: "Our ministry only says that it is in favor of GRESes. But its deeds are something else again... We only recently received equipment, but the workers had already left. Now we

are in urgent need of 1500 construction men. Where can we get them?

In the spring of this year the directors of Tsentroenergomontazh sent 150 highly skilled fitters to the Belovo GRES. People came from many important construction jobs throughout Siberia. They expected to go to work immediately. It turned out that there was nothing for fitters to do here, and they were forced to handle subsidiary jobs. They were changed into loaders and ditch diggers. They started working with enthusiasm, thinking that in another month or two things would be all right. But time passed and nothing changed.

The situation at the Belovo GRES is even worse than at the Tom'-Usinskaya. Not one of the sectors is fulfilling its assignment, equipment is standing around idle and the quality of work is low. Losses are running into the hundreds of thousands of rubles. In the second quarter of 1962 the first turbine is to produce industrial current for the Kuzbass. But if construction on the GRES continues to proceed at the same rate, it is doubtful that it will meet the deadline. The ministry is unjustifiably delaying the construction of the Tom'-Usinskaya and Belovo GRESes. Thermo-electric power stations are being put into operation extremely slowly also in other economic rayons. For four months of this year capital investments were achieved at 105% for GESes, but for GRESes -- only 82%.

ELECTRIC POWER CONSTRUCTION -- Moscow, Ekonomicheskaya Gazeta, 30 June 1961, page 1.

Khrushchev stated that one of the leading detachments of builders of communism is made up of those persons who are building electric power stations and networks. A great and honorable task has been handed them -- to incorporate the Leninist idea of complete electrification of the country. Struggling for a rapid fulfillment of this task, the electric power construction men have pledged the following: to complete all construction-installation jobs outlined in the plan for the third year of the Seven Year Plan ahead of time; to increase the production and utilization of prefabricated reinforced concrete structures; to expand the application of construction machinery; to increase labor productivity; to decrease the cost of building electric power stations.

During the period of preparation of the 22nd Party

Congress, at thermo-electric power stations new, large boilers, turbines and generators are going into operation. At the Bratsk GES installation will be completed on the world's largest hydroturbine, with a capacity of 225,000 kwt. New power plants at the Bukhtarminskaya and other power stations will start producing electric power. The Stalingrad and Kremenchug GESes will be ready for constant operations. The length of high-tension power transmission lines will stretch out for many thousands of km. Competition between electric power construction men has gained momentum for a worthy greeting to the 22nd Party Congress. Among the front ranks are the collectives of construction men and fitters of the Staro-Beshevskaya, Zmeyevskaya and Baltic thermo-electric power stations. The workers of the Donbassenergostroy Trust are distinguished by fine labor organization and a high production level. Metal fitters-assemblers of Teploenergomontazh are working with assurance and creative inventiveness. Obligations are also being successfully fulfilled at the construction sites of the Troitskaya and several other GESes.

At the same time there are alarm signals. Things are not progressing well at the sites of Sibenergostroy. Work done by Yuzhenergostroy is worse than before. Great difficulties are cropping up at the construction sites due to frequent changes in plans, late delivery of prefabricated reinforced concrete, wall panels and equipment, due to poor job organization. This extends the time required for construction and causes overexpenditure of state funds. The economic structure of power construction is not being given sufficient attention. The USSR MEPSC has not drawn the necessary conclusions from the results of the past year, when overexpenditure of estimated cost occurred at more than one third of all electric power construction projects. There were many cases of inefficient expenditure of materials. The Ekonomicheskaya Gazeta brought forth these facts for the Krasnoyarsk GES, the Nararovskaya GRES and certain major thermo-electric power stations.

This year little has changed. Right now at many construction projects the plan is not being fulfilled while at the same time great overexpenditures of cash funds and material resources are being allowed. Construction is progressing slowly and is extremely expensive, particularly at the TETs of the Western Siberia Metallurgical Plant. One of the reasons for increased construction costs is the fact that many jobs which should be done in the summer are delayed until fall and winter. It is true that those times are long past when construction jobs were carried out only according to season. However, this does not mean that now

it is no longer necessary to take into consideration the influence of the seasons on construction economy. It is a known fact that earth moving under frozen soil conditions costs five and sometimes ten times more than ordinarily. The productivity of operations carried out in the open air decreases 150-200%. It would seem that the conclusion to be drawn is obvious: we must make maximum use of the warm season of the year for jobs which cost much more in winter; the building structures of newly built installations should be closed and heated before the cold weather sets in. Unfortunately, electric power construction men often do not proceed in this manner. Large overexpenditures were made in constructing the Karaganda GRES-2 and the Belevo electric power station because they did not succeed in completing earth and concrete work before winter.

There is certain fear that also this year jobs will be delayed until winter which can and should be done in the summer. Signs of lagging behind schedule are appearing at many construction projects. At one of the most important construction jobs of the Seven Year Plan -- the Konakovskaya GRES,--the full capacity of which should amount to 2,400,000 kwt -- there is still a lack of planning-technical documentation, and there is a shortage of construction machinery. Much valuable time has been wasted in the construction of the Lithuanian GRES. Work is going at an insufficiently intense rate at the Cherepetskaya and Pridneprovskaya thermo-electric power stations, where the country's first 300,000 blocks will be installed. Such defects are perhaps even more inherent in sovnarkhozes which are constructing industrial TETses. This is the story we get from the thermo-electric power center of the Orsko-Khalilovskiy Metallurgical Combine (Orenburgskiy Sovnarkhoz). Construction jobs for expanding the TETs, which can be done only in summer, have now been stopped altogether; the workers have been sent to other installations. Unfortunately, there are many such examples.

The basic and main task of electric power construction men is to put new electric power facilities into operation as rapidly as possible and to create a backlog for the successful development of power engineering in ensuing years with minimum expenditures. One can say without fear of exaggeration that the fulfillment of this task depends completely on the degree of intensity the summer is used. This condition is particularly important for the projects of the Urals, Siberia and the Far East. No concerted effort will help at the end of the year if the summertime is wasted. Right now the entire country is preparing for the 22nd Party Congress. This event, which is so important in the life of

the Party and the country, has caused a new upswing of labor heroism. Construction men and fitters are filled with the fervent desire to fulfill and overfulfill obligations assumed for a more rapid electrification of the country. Planners, planning and supply organizations, supplier plants, directors of construction administrations, sovnarkhozes and the MEPSC are obligated to assure all essential conditions for this. Electric power construction men should greet the 22nd Party Congress with new achievements in speeding up construction and lowering the construction costs of powerful electric power stations and high-tension electric power transmission lines.

ECONOMIZING ON ELECTRIC POWER -- Moscow, Promyshlennaya Energetika, No 7, July 1961, pages 1-3.

For effecting more operative control over electric power expenditure, the USSR Central Statistical Administration has established monthly accounts for industrial enterprises on the fulfillment of electric power norms. With the purpose of publicizing the problems of electric power economy in the national economy, the Moscow and Leningrad Popular Science Film Studios are making the following films: "Utilize Electric Power Efficiently", "What is the Power Coefficient?", etc. One film has been completed and the others are to be made in 1961. In 1960 many conferences were held with workers of industrial enterprises and power supply organizations on electric power economy: for the Central, Northwest, Southern, Eastern, Urals, Central Asian and Kazakhstan sovnarkhoz power systems. All-union conferences of power engineers were held in Stalingrad and Ivanovo.

Directed by the instructions of the CC of the Party and USSR Council of Ministers, Party, union and Komsomol organizations, power supply organizations and industrial power engineers carried out in 1960 much organizational and technical work for improving the utilization of electric power. Conferences of rayon and city party committees, sovnarkhozes and enterprises mobilized the workers in the campaign to economize on electric power.

As a result of this work and execution of organizational-technical measures in industry, savings in electric power were effected in 1960 in the amount of more than 6 billion kwt/hrs beyond present specific norms. If we con-

sider that the specific electric power expenditure norms for 1960 were revised and decreased an average of 2-3% below 1959 norms, actual savings in electric power in 1960 were 9.5 billion kwt/hrs as against 1959 specific norms. A decisive factor in the attainment of high electric power savings indices are the measures connected with the incorporation of new equipment and improvement of production technology. The highest percentage of savings was achieved in the machine-building and metal working industry. Decrease in expenditure coefficients in this branch occurred chiefly by means of replacing obsolete equipment with improved equipment, the implementation of automatic assembly lines, the utilization of advanced methods of processing items (stamping and press-working instead of cut-machining, the implementation of accurate casting, etc.), and the use of machine tools with program control.

In the metallurgical industry considerable savings in electric power are achieved by a greater use of natural gas in open hearth furnaces and production boiler facilities, improvement in the use of secondary power resources in the form of blast furnace and coke gas, expansion of the application of force-feed oxygen in smelting steel in electric furnaces, increase in the load capacity of electric furnaces and high-speed smelting methods, and improvement in the system of water-cooling open hearth and blast furnaces.

An important role in decreasing specific electric power expenditures was played by further automation of controlling the smelting process in electric furnaces, the use of the duplex process, increasing the ingot temperature in rolling, increased efficiency in the rolling process. In thermal shops savings were achieved chiefly due to a greater use of induction heating instead of heating in resistance furnaces, automation and programmed regulation of furnace operations, etc. In the coal industry measures improving the use of electric power were carried out, leading to an improvement in the ventilation system, elimination of superfluous stages in water removal, improvement in the operation rate of water discharge facilities, etc. In other branches of industry (chemical, light industry, construction material industry, etc.) specific expenditures of electric power per unit of production were also decreased significantly due to the application of new and improved equipment and the implementation of modern production methods.

THERMO-ELECTRIC POWER STATIONS -- Moscow, Ekonomicheskaya Gazeta, 14 July 1961, page 2.

In 1965, the last year of the Seven Year Plan, more than 400 billion kwt/hrs of electric power of the total of 500-520 billion will be put out by thermo-electric power stations. For this purpose, in 1961-1965 it will be necessary to introduce more than 40 million kwt of new output capacity. The rate of output increase at TETses should at least double this year in comparison with last. In addition, it is necessary to create a backlog -- to prepare one and one half times the output of 1961 for 1962 and the first quarter of 1963. Worthy of particular attention are the first 300,000 kwt blocks at the Cherepetskaya and Pridneprovskaya GRESes, with boilers with a productivity of 950 tons of steam per hour. This year construction should also proceed at top speed of the following TETses: Yermakovskaya, Konakovskaya, Krivorozhskaya, Lithuanian, Tashkent, Kuchurganzkaya and others, with a total output of 10 million kwt. Construction must begin on TETses at the most important enterprises of the chemical, metallurgical, pulp and paper and other branches of industry.

Capital investment in building TETses has been increased 40% this year in comparison with last. The most important installation include the following: Baltic, Southern Urals, Verkhne-Tagil'skaya, Troitskaya, Tom'-Usinskaya, Belovo, Karaganda No 2, Zmiyevskaya, Staro-Beshevskaya, Luganskaya, Pridneprovskaya GRES, the TETs of the Western Siberian Metallurgical Plant and several others. More than one half of new power output planned for the third year of the Seven Year Plan will be produced by these major electric power stations.

The MEPSC USSR should complete more than 60% of all construction jobs at thermo-electric power stations. However, it has occupied an inconsistent position in problems concerning speeding up construction. When the annual plan is drawn up, the volume of capital investment in thermo-power engineering usually causes no difference of opinion. The debates begin as a rule after the ratification of the plan. This year the ministry and its Sevenergostroy Trust are requesting that work volume be decreased on the sites of the Lithuanian, Baltic and certain other stations. A lack of attention on the part of the ministry toward building thermo-electric power stations has led to a situation whereby the plan for putting new units into operation was not fulfilled last year. Things are even worse this year at the power projects of the sovnarkhozes, particularly in

the Arkhangel'skiy, Tatarskiy, Omskiy, Vostochno-Kazakhstanskiy, Kustanayskiy, and Karagandinskiy economic rayons.

According to figures for five months of this year, considerably less new output has been added than planned. The MEPSC has not yet stepped up the work pace at the most important projects. What is hindering the rapid construction of thermo-electric power stations? In our opinion there are several reasons. The ministry is doing a poor job of coordinating the activities of its subordinate planning and construction organizations, is not maintaining the necessary contact with the plants which are producing the equipment. Due to this plans and blueprints are often redone. Technical documentation is issued without considering the possibility of producing structures at ministry bases, and technical decisions are changed frequently. Therefore, the drawings for the Cherepetskaya GRES, where the main block, with a 300,000 kwt capacity, is being installed, were delayed for a long time. The deadline for completion of construction of the main structure is threatened. In the interest of gaining experience this block should be put into operation as soon as possible, since similar blocks are to be installed by the end of the Seven Year Plan at many electric power stations. The builders of the Konakovskaya, Yermakovskaya, Lithuanian and certain other GRESes are not provided with drawings. The established order is regularly violated, according to which the working drawings are to be submitted to the builders no later than six months before beginning of construction.

More than three years have passed since prefabricated reinforced concrete began to receive broad use in the construction of thermo-electric power stations. However, even now the ministry has not drawn up a plan for reequipping construction organizations and has not determined how much and what type of machinery is required and has not furnished this machinery to the construction projects. As a result of this, at the sites of the Tom'-Usinskaya GRES, the TETs of the Western Siberian Metallurgical Plant and several other construction sites there are no tower cranes with a load capacity of from 40-75 tons, as well as other machinery. The minister of EPSC, Novikov, has stated repeatedly that thermo-electric power stations can be built within two to two and one half years if the necessary machinery is available as well as a powerful base for producing prefabricated reinforced concrete. However, the ministry itself is not devoting enough attention to this. Projects for developing the construction industry were fulfilled by last year (in volume) by only 83%. New facilities for the production of prefabricated reinforced concrete were developed at slightly

more than half that planned. Present plants and bases for the production of prefabricated reinforced concrete are not being used efficiently. The Vasilevichskaya, Tom's-Usinskaya, Karaganda and other bases are producing much defective material. There is no order in production planning. In December of last year the Tom'-Usinskaya and Navarovskaya bases did not yet have their production programs and orders even for the first quarter of 1961. Consequently, they were not able to prepare the necessary technological production equipment. These bases were to produce the skeletons of the main buildings of the Tom'-Usinskaya and Belovo GRESes in the second half of last year, although by December there still was a debate going on as to who should develop the lacking working drawings for metal casing -- Teploelektroproyekt or Orgenergostroy.

The MES regularly receives tremendous material resources from the state. This year it was allocated more than 5,000 trucks, 800 tractors and other means of transport. But they are not always distributed efficiently by the ministry. The builders of thermo-electric power stations are fulfilling the basic plan for putting new electric power capacity into operation, but they have been given only ¼ of all machinery and means of transport at the disposal of the ministry. The Sevenergostroy and Sibenergostroy trusts are more poorly equipped than the others. Problems of specialization are being resolved slowly. Combined organizations (trusts) are doing the basic GRES construction. Specialists in installing complicated technological and thermo-mechanical equipment are often used to install sanitation facilities, and sometimes even for laying sewer pipe. The ministry does not have a department to regularly check for improvement in installation work. Problems of welding thick-walled, high-alloy steel pipe are not being given much study.

It is also necessary to note that the ministry is carrying out many jobs having no connection with power engineering. It is building carpet, textile, ore concentration and pulp and paper combines, chemical, cement and machinery plants. Machinery and cadres are being diverted away from power projects. It is obvious that the USSR Gosplan, together with the union republic gosplans, should accelerate a solution to the problem of transfering certain construction projects from the ministry to the sovnarkhozes. An important role in speeding up and lowering the cost of construction of thermo-electric power stations is played by the sovnarkhozes, which are building many thermo-electric power plants with their own resources. Unfortunately, many sovnarkhozes are doing a poor job of supplying these construct-

ion sites with materials, machinery and prefabricated reinforced concrete. The Vostochno-Kazakhstanskiy Sovnarkhoz has delayed for three years the beginning of operations of the power plants at one of the important TETses. In the majority of cases the sovnarkhoz directors begin to pay attention to the construction of electric power stations only after a shortage of electric power, steam or hot water occurs at their enterprises. Often sovnarkhozes slow down the ratification of projects for constructing TETses. The Leningradskiy Sovnarkhoz has delayed for almost a year the ratification of the project for expanding TETs No 14. As a result a backlog was not formed last year for expanding this power station, and the beginning of operations of a new turbine at the TETs is not included in the 1961 plan.

Much can and should be done by sovnarkhozes in order to make timely delivery of equipment to new power stations, for improving equipment quality. The cost of correcting defects at the construction site in boilers produced by the Taganrog and Podol'sk plants was approximately equal to the cost of their installation. A few years ago plants were required to produce and deliver boilers in large blocks. As is known, this decreases 25-30% total labor expenditures on production and installation and improves quality. At the Taganrog Boiler Factory construction is finally nearing completion of a shop for assembling such equipment in large blocks. However, at the plant, as in the Rostovskiy Sovnarkhoz and in the All-union Economic Council, no-one is in a hurry to begin large-block boiler production. In addition, there are persons who are proposing to use the new building for other production.

Some people are resisting large-block boiler construction, and this resistance must be broken. Planning organs should plan for 1962 the delivery of at least 30% of boilers in blocks and not credit plan fulfillment to plants which deliver them at various intervals. Power construction has not been freed of those major defects indicated by Khrushchev in his speech in Alma-Ata on 24 June: the plan for bringing new facilities into operation is not being fulfilled satisfactorily; labor and funds are being scattered; materials and funds are immobilized for years. We must establish more strict control over the construction of electric power stations, increase the responsibility of all workers participating in this, as regards state plan fulfillment.

10,284

NEWS BRIEFS

Moscow, Ekonomicheskaya Gazeta, 9 Jun 61

According to the existing plans, electric power generating facilities with a total capacity of more than 10 million kw will be put in operation in the USSR in 1962.

Vil'nyus, Sovetskaya Litva, 6 Jun 61

The work on the Shaulyay-Klaypeda high-voltage transmission line is progressing at a large scale. The city of Tel'shay will be connected to the grid of the state power system during June and the entire line will be completed in September 1961.

The following high-voltage lines are under construction at present: Ukmerze-Anikshchyay, Tel'shyay-Varnyay, Raseynyay-Aregala, and Kalvariya-Lazdiyay. All together more than 5,500 km of high- and low-voltage lines will be completed in the Lithuanian SSR in 1961.

Moscow, Ekonomicheskaya Gazeta, 9 Jun 61

The construction has started of Yaroslavl'-Danilov high-voltage power transmission line in Yaroslavskaya Oblast. The line will supply power to the electrified Northern Railroad System.

Another high-voltage line will be built from Yaroslav'' to Gavrilov and Yama.

Moscow, Stroitel'naya Gazeta, 16 Jun 61

The 193 km long 22 kw Suchan-Goreloye section of the Suchan-Tetyukhe electric power transmission line has been put in operation in Primorskiy Kray.

Leningrad, Leningradskaya Pravda, 24 May 61

The 500 kv electric power transmission line which will be completed in the Seven Year Plan, will interconnect the power systems of Irkutsk, Krasnoyarsk and the Kuzbass.

A 154 km section of the line between Krasnoyarsk and Kamala has been completed. The construction of Krasnoyarsk-

Nazarovo section of the line is now underway; it will be completed in 1961 to supply power to Krasnoyarsk from the Nazarovskaya GRES.

Moscow, Ekonomicheskaya Gazeta, 10 May 61

The construction of a high-voltage electric power transmission line across the Amur River near Khabarovsk, and the high-voltage Khabarovsk-Birobidzhan Transmission line has started.

This is the first step in creating the unified electric power system of the Far East. The system will include a number of powerful electric power stations in Khabarovskiy Kray, Amurskaya Oblast, and Primorskiy Kray.

Moscow, Ekonomicheskaya Gazeta, 30 May 61

The Nal'chik-Prokhladnyy high-voltage electric power transmission line was put in operation recently. The power which has in the past been supplied to the enterprises in the city of Prokhladnyy from numerous small electric power stations, now is supplied from the network of the North Caucasus Power System.

Moscow, Sovetskaya Rossiya, 31 May 61

A high-voltage electric power transmission line is under construction between Nizhne-Turinskaya GRES and the construction site of the Kachkanar Ore Dressing Combine. The line will be completed in June 1961.

Moscow, Ekonomicheskaya Gazeta, 17 May 61

The second circuit of the Magnitogorsk-Beloretsk high-voltage power transmission line has been completed. The construction of the extension to Tukan has started. In the future the line will be further extended to Starlitamak, thus providing an interconnection via Beloretsk, between Chelyabenergo and Bashenergo power systems.

Moscow, Stroitel'naya Gazeta, 21 Jun 61

The 160 km long Cheboksary-Shumerlya electric power

transmission line has been completed and put in operation in the Chuvaxh ASSR.

Moscow, Ekonomicheskaya Gazeta, 27 Apr 61

The 150 km long Belova-Anzhero-Sudzhensk 220 kv electric power transmission line is now in operation. At present there are 500 km of 220 kv lines in operation in the Kemerovskiy Economic Rayon. The Belovo-Novosibirsk line will be in operation soon.

The construction of the second high-voltage Rybinsk-Cherepovets transmission line has started.

Alma-Ata, Alma-Atinskaya Pravda, 8 Apr 61

The construction work has started on the Kirovokanskaya TETs in the Armenian SSR. When completed the TETs will supply electric power, steam and hot water to the chemical industry enterprises in Kirovokan. The TETs will operate on the natural gas supplied from the Azerbaydzhan SSR.

Moscow, Sovetskaya Rossiya, 26 May 61

The construction has started of the Ingurskaya GES on the Inguri River in West Georgia. The GES will have a capacity of 1,630,000 kw.

Leningrad, Lningradskaya Pravda, 3 Jun 61

A GES is now under construction on the Khrami River in the mountainous region about 80 km from Tbilisi. The turbines of the GES with a capacity of 56,000 kw each will be installed underground. The first and second turbines have already been shipped to the construction site.

Alma-Ata, Kazakhstanskaya Pravda, 11 Jun 61

The construction of the Uyyedenskaya GES was started in 1960. The GES is built on the Uyydena River in the Saur mountains in the Kazakh SSR.

Alma-Ata, Kazakhstanskaya Pravda, 11 May 61

The work has started on the construction of the hydrotechnical development located near the Chinese border about 500 km from the Bukhtarminskaya GES. The development will include a GES which will help to complete electrification of a large area, and supply power to the irrigation facilities to develop a oasis in the semi-desert Saisan badlands.

The Sogrinskaya TETs which is under construction in the Ul'ba River Valley will be put in operation in 1961.

Alma-Ata, Kazakhstanskaya Pravda, 23 May 61

The four generators of the Bukhtarminskaya GES now in operation, supply power to the East Kazakhstan. All the important units of the GES are automatically operated. There are only 5 persons at a time on duty at the GES. When the GES is completed, there will be only three persons on duty.

Khabarovsk, Tikhookeanskaya Zvezda, 11 Aug 60

A GES will be built on the At-Bashi River in the narrow Shaytan Kopchagay Gorge in the Kirgiz SSR. The GES will be the larges in Tyan'-Shan'skaya Oblast.

Leningrad, Vecherniy Leningrad, 20 aApril 61

The builders of the Novo-Voronezhskaya AES have decided to complete in 1961 the installation of three turbine-generator units, including their auxilliary equipment.

Moscow, Ekonomicheskaya Gazeta, 30 May 61

The third steam turbine for the Novo-Voronezhskaya AES, with a capacity of 70,000 kw was completed at the Khar'kov Plant imeni Kirov on 29 May 1961.

Baku, Bakinskiy Rabochiy, 19 May 61

The installatinn has started of the first steam turbine with a capacity of 70,000 kw at the Novo-Voronezh

atomic electric power staion.

Moscow, Ekonomicheskaya Gazeta, 14 May 61

The construction has started on the Konakovskaya GRES near the city of Konakovo near Moscow. The GRES will have a capacity of 2,400 Mw. It has been decided to install 300 Mw power units at the GRES.

Moscow, Komsomol'skaya Pravda, 21 May 61

The power units of the first section will be put in operation in 1961 at the Okhtinskaya TETs on Sakhalin Island.

The TETs, which will operate on natural gas, will supply power to the oil fields on Northern Sakhalin.

Moscow, Stroitel'naya Gazeta. 4 Jun 61

Plans are being prepared for a cascade of 14 GES on the Katun' River in the Gorno-Altayskaya Autonomous Oblast. The GES of the cascade will supply power to the industries to be created to utilize local resources and to the enterprises in Biysk and Barnaul. Geological surveys at the construction sites are now under way.

Moscow, Leninskoye Znamya, 3 Jun 61

A GES with a capacity of 15,000 kw is under construction on the Chuya River in the Gorno-Altayskaya Autonomous Oblast. When completed, the GES will supply power to the mines and villages of the Altay Region.

Moscow, Ekonomicheskaya Gazeta, 7 Jun 61

A new TETs is under construction in Mary, in the Turkmen SSR. The first power unit of the TETs will be in operation in 1963.

Preliminary work is underway to build the TETs No w 2 in Krasnovodsk.

Moscow, Ekonomicheskaya Gazeta, 17 May 61

A powerful power unit has been put in operation at the Pridneprovskaya TETs.

Leningrad, Leningradskaya Pravda, 26 May 61

Electric power generating facilities with a total capacity of 1.44 million kw will be put in operation in the Ukrainian SSR in 1961.

The installation of a power unit with a capacity of 200 Mw has been completed. The operation of the unit is fully automatic; the unit will be in operation in June 1961. Powerful steam turbines will be installed also in 1961 at the Luganskaya TES and the Zmiyevskaya TES, and powerful gas turbines at Kiyevskaya GRES No 2 and Kharkovskaya TETs No 3.

Kiev, Pravda Ukrainy, 30 May 61

The construction of the Kiyevskaya GES is now in progress on the Dnepr River near the village of Vyshgorod.

10,284

-END-